

Designing Effective Double Blind Soil Performance Evaluation Studies



John Laferty

DOD Environmental Monitoring &
Data Quality Workshop

Reno, NV

10-14 May 2004



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Introduction



⌘ *Who*

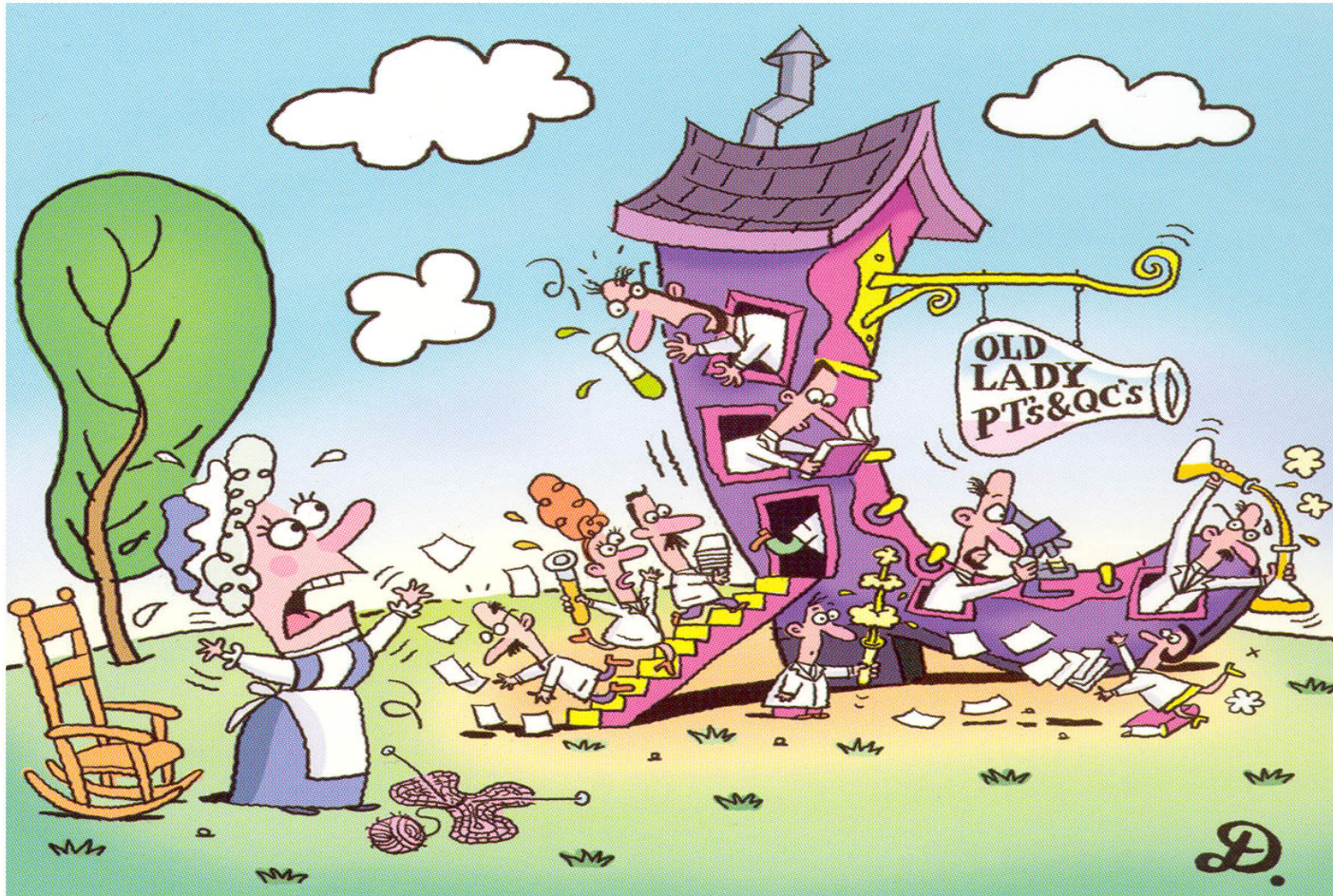
⌘ *What*

⌘ *Why*



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Who is ERA?



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ERA is.....

- ☒ Nationally recognized provider of environmental PT & QC standards
- ☒ 27+ years experience
- ☒ A2LA and NIST accredited
- ☒ Inorganics, Organics, Microbiology, WET, Radiochemistry
- ☒ Water, Soil, Air, Biota, Food...
- ☒ ERA pioneered the use of Double Blind samples ~ 15 years ago

www.eraqc.com

What are PT/QC standards?

☒ QC = *Quality Control*

☒ Typically analyzed by a laboratory as known samples

☒ PT = *Proficiency Testing*


☒ Single Blind, e.g. analytes and/or concentrations are unknown to the laboratory

☒ Double Blind

☒ Totally blind to laboratory

☒ *TotaLaBTM*....





Why are Double Blind studies necessary?



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Double Blinds



- ☑ Use as an independent audit
- ☑ Only way to evaluate your lab's **routine** performance
 - ☒ Remember, single blind = a lab's **best** performance
- ☑ Results directly relatable to the quality of your sample results

Sample Design Considerations

- ☒ Analytes
- ☒ Concentrations
- ☒ Sample appearance
- ☒ Packaging





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Sample Introduction Pathways



- ☒ Incorporate with routine field samples
- ☒ Fictitious firm



Data Evaluation

☒ *ERA PALs™* - Performance Acceptance Limits

☒ Based on historical data ERA has collected from similar studies

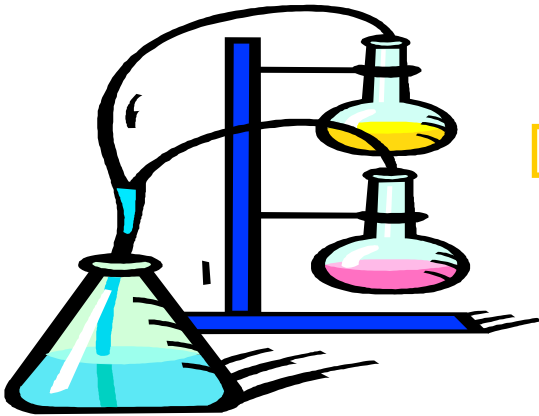
☒ Acceptance limits based on historical data from the site

☒ Method default acceptance limits



Analytical Challenges

- ☒ Hydrated soils do present recovery problems for many methods
- ☒ Interfering analytes can be added to samples



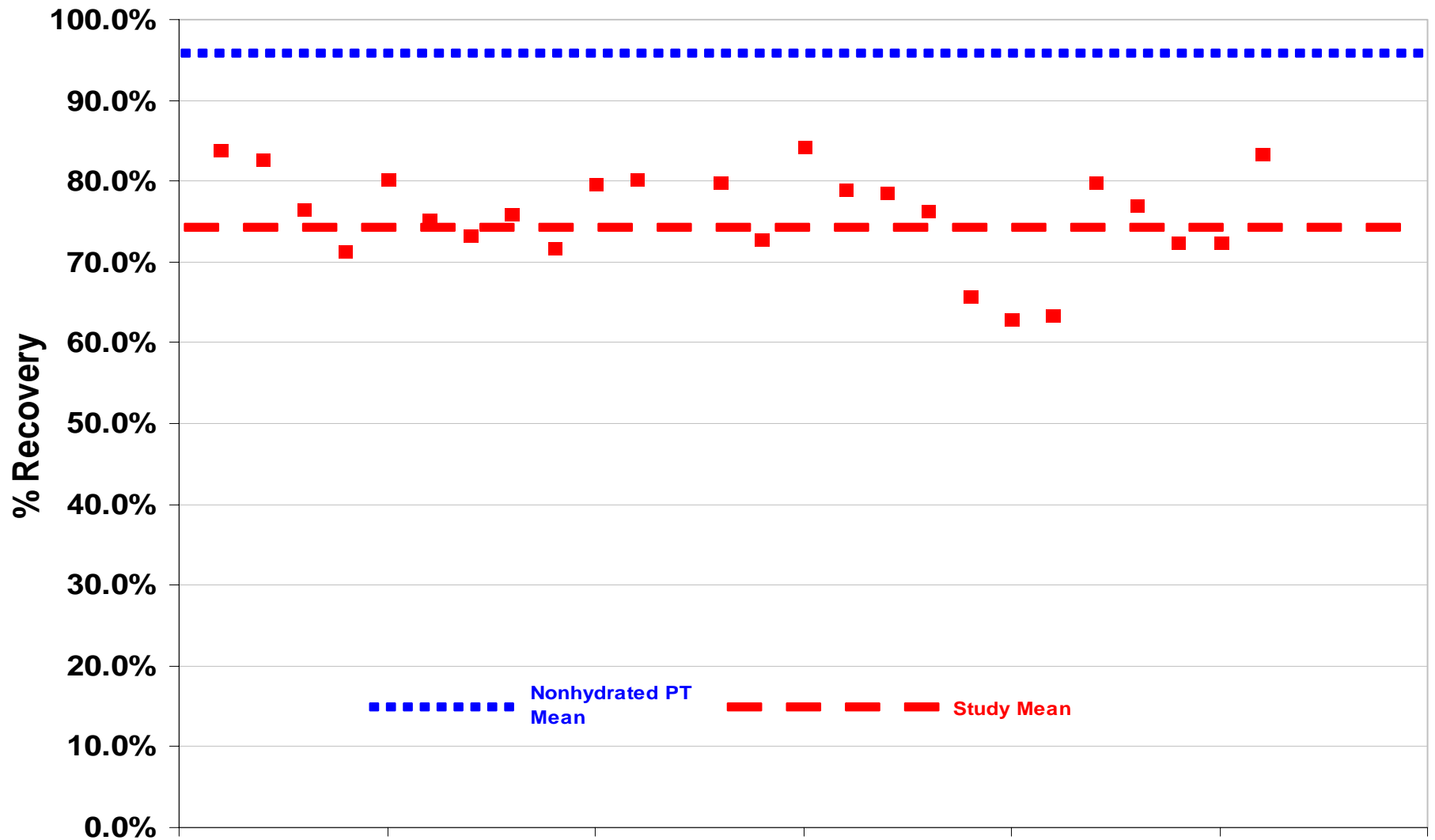


Laboratory Data

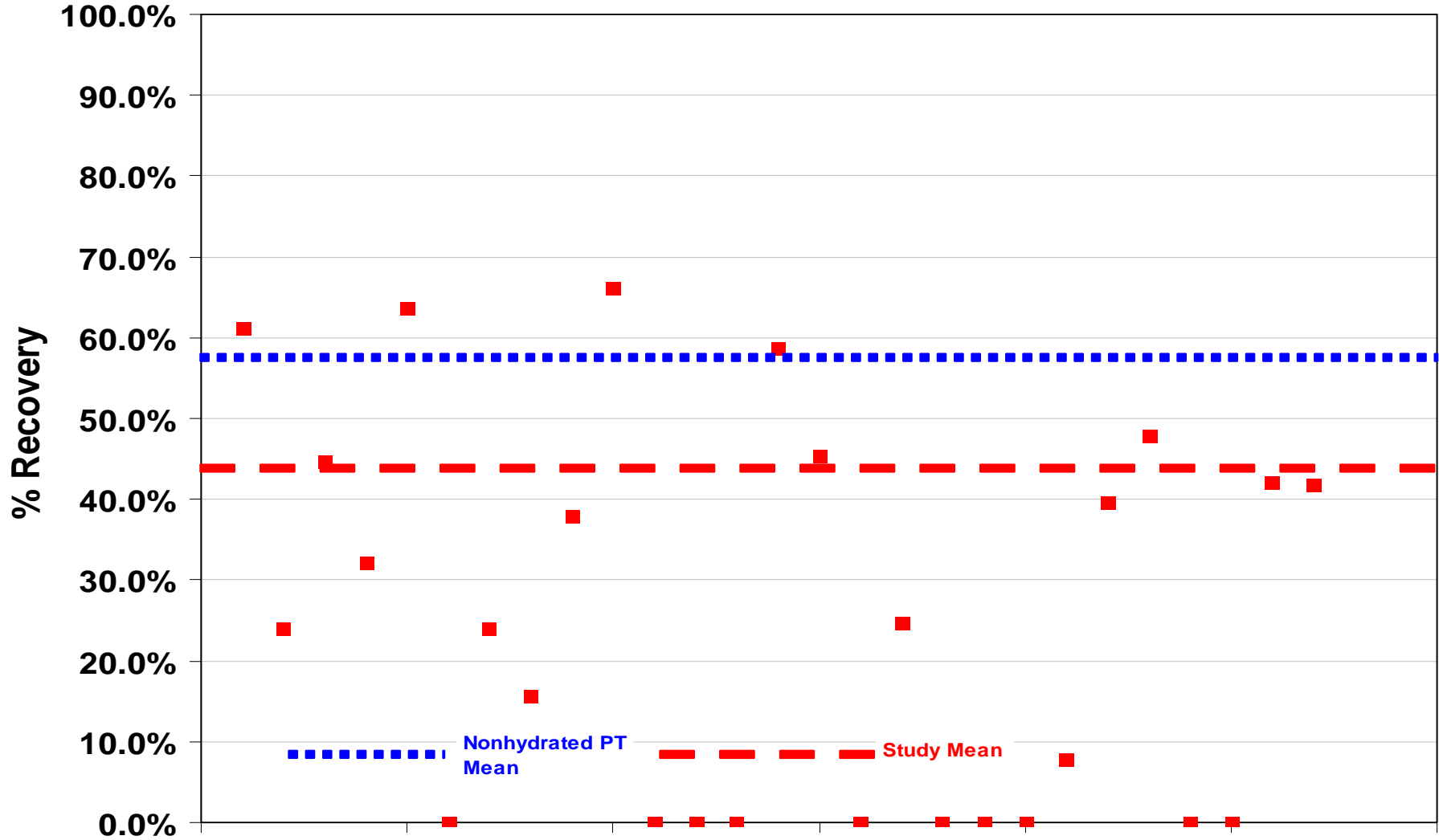


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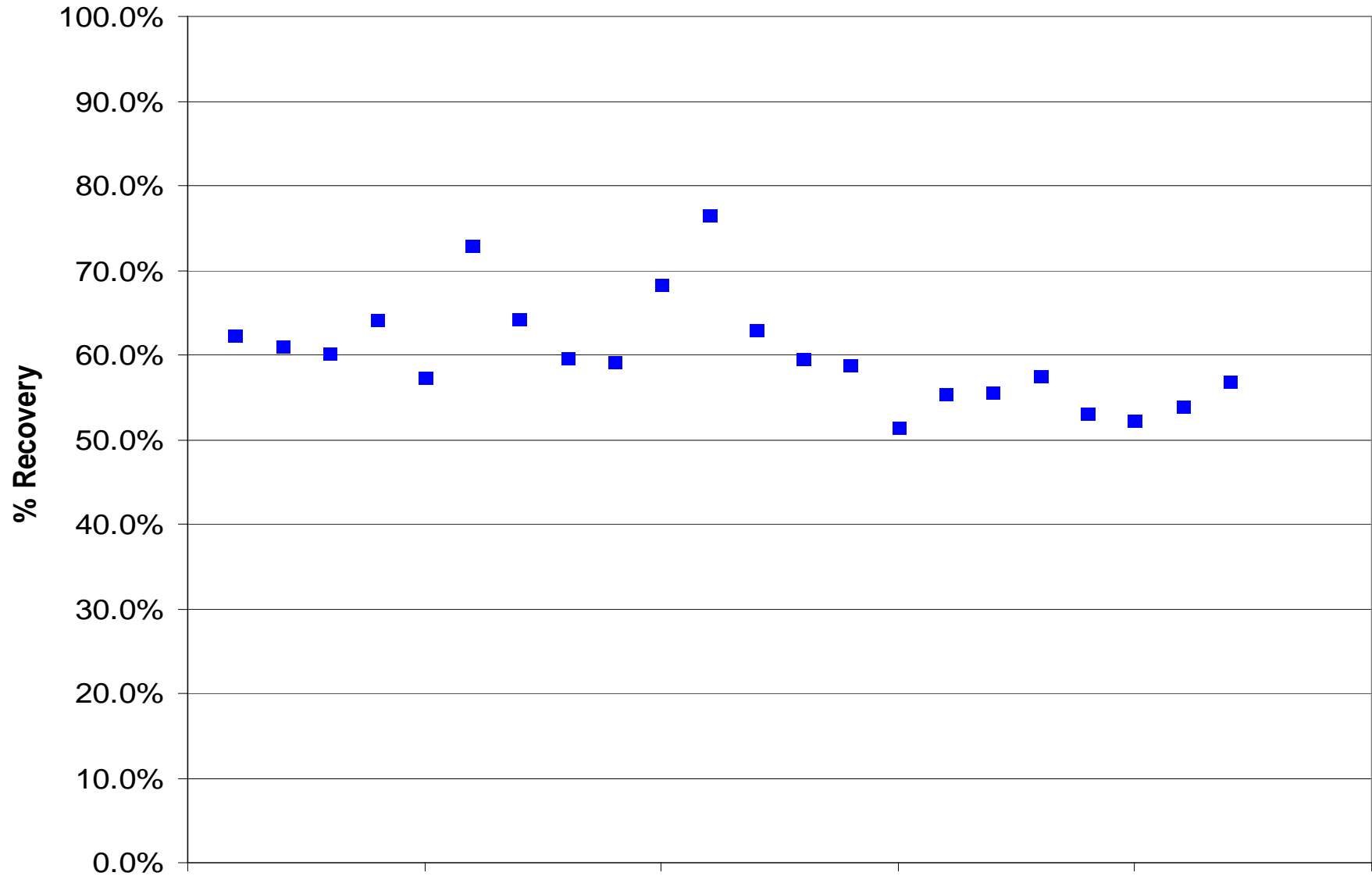
Lead in Soil (18.3% moisture)



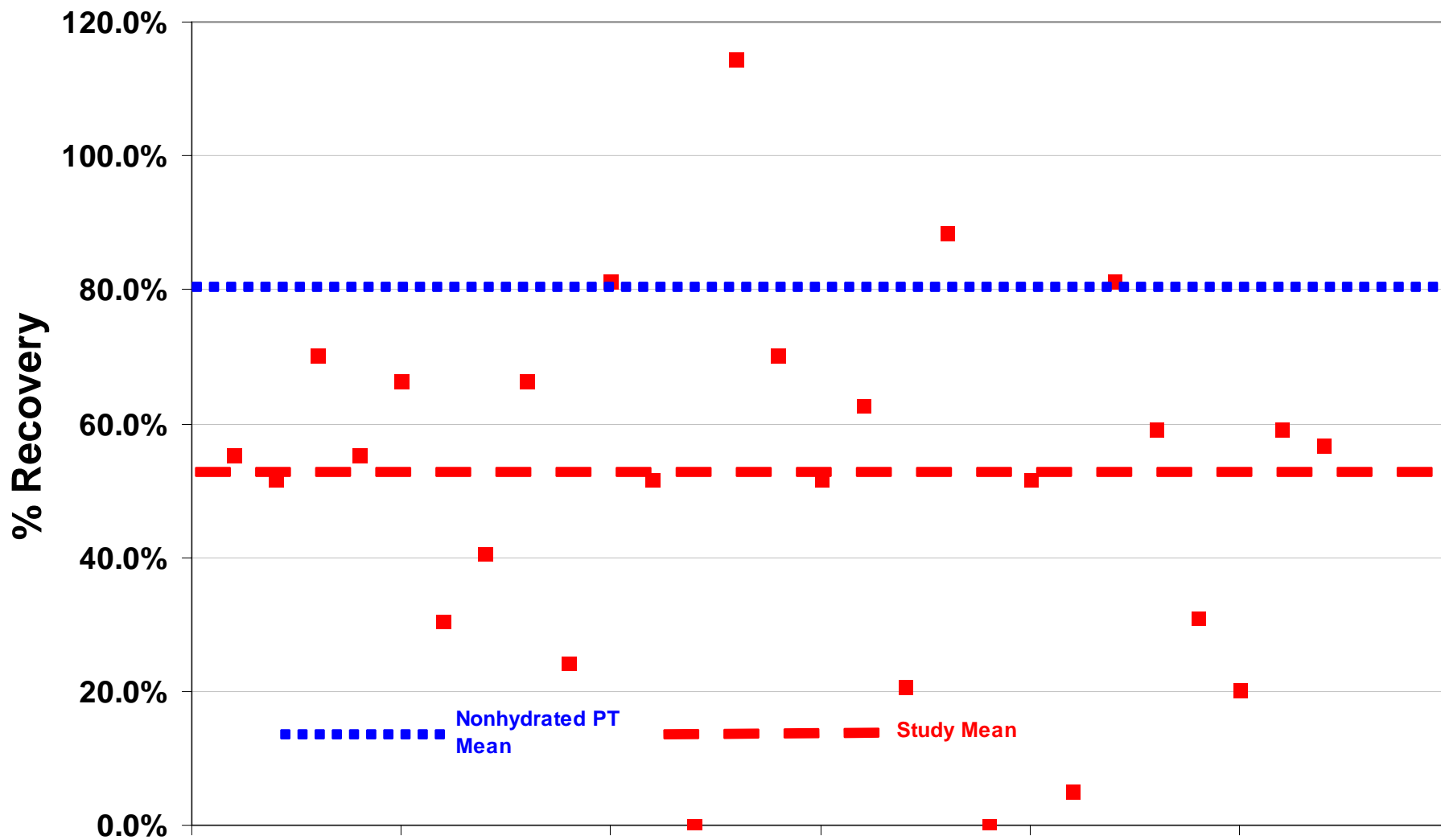
Pentachlorophenol in Soil (18.3% moisture)



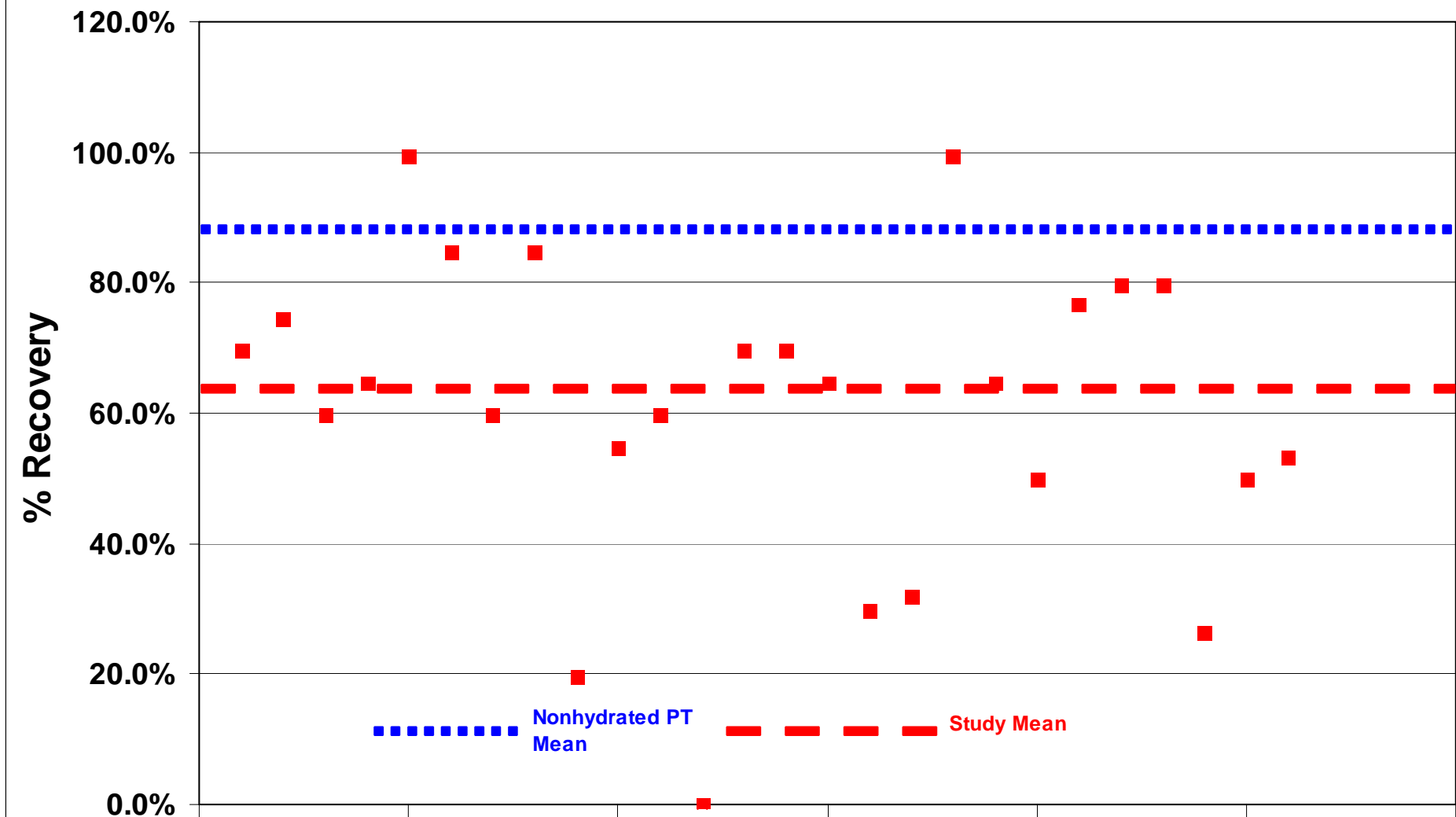
Pentachlorophenol in Soil - Nonhydrated PT



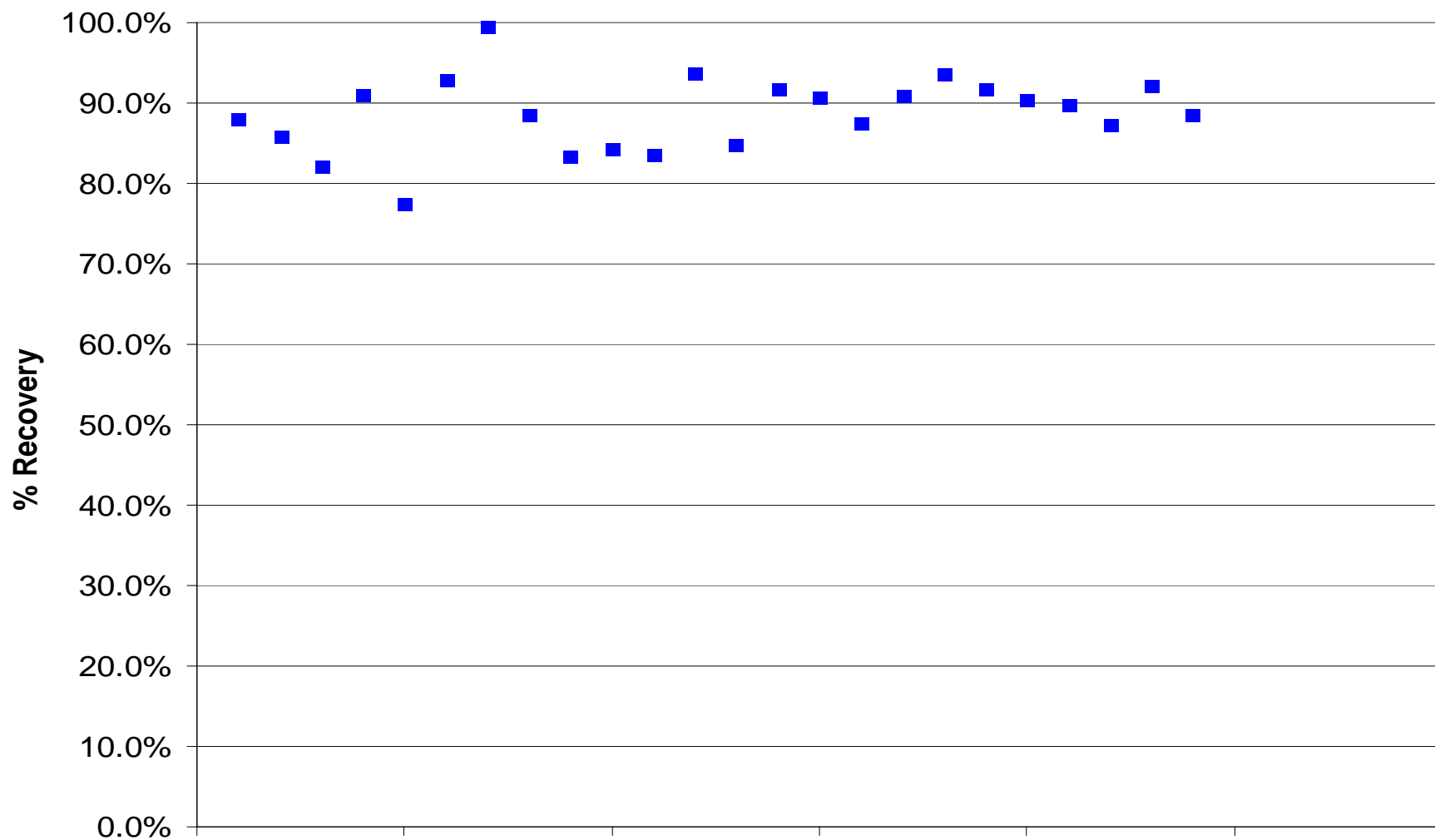
bis(2-Ethylhexyl)phthalate in Soil (18.3% moisture)



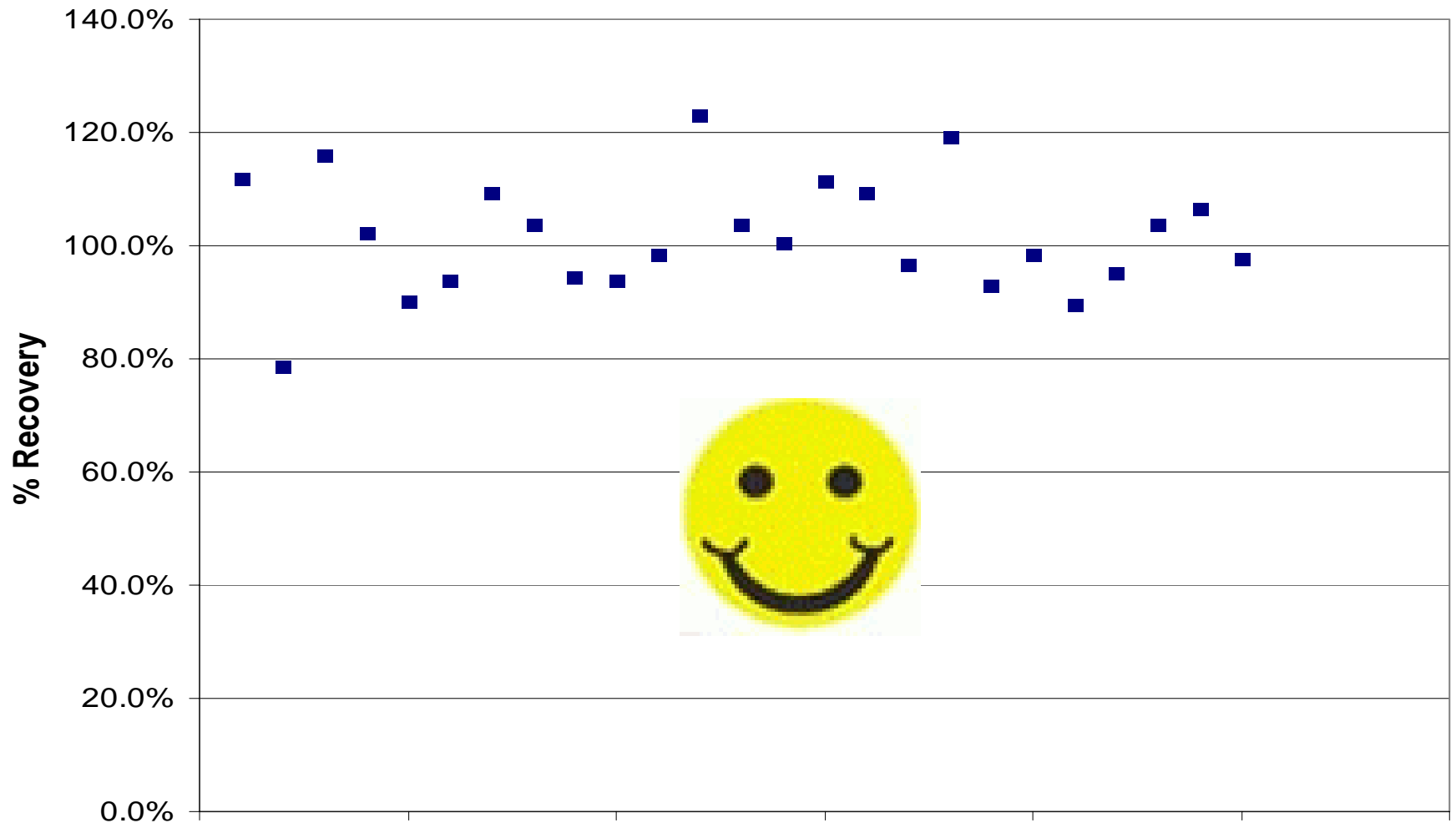
Dieldrin in Soil (18.3% moisture)



Dieldrin in Soil - Nonhydrated PT



% Moisture in Soil





Questions



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Thanks!

A horizontal yellow brushstroke with a textured, painterly appearance, spanning the width of the slide.

John Laferty
1-800-372-0122
jlaferty@eraqc.com



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